

## Greengas AD (Limerick, Ireland)



### A short introduction to Greengas AD

GreenGas AD Plant is a farm based anaerobic digestion plant located near Shanagolden in County Limerick, Ireland. The the 250 kW<sub>el</sub> plant was constructed in the course of 2010 and when commissioned in 2011 it was one of the first such plants in Ireland. The plant has undergone a number of upgrades and now operates at 1MW<sub>el</sub>.

### Feedstocks

The plant processes wastes from a poultry and dairy farm as well as other imported organic feedstocks such as waste agricultural residues and food wastes (Table 2).

### Biogas production

Currently GreenGas AD Plant produces over 2,400,000m<sup>3</sup> of energy rich renewable gas for the production of electricity and heat through use of a high efficiency combined heat and power unit (CHP). The electricity generated is sold to the national grid under the Renewable Energy Feed In Tariff scheme (REFIT), the heat is recycled for use in the plant and the nearby poultry enterprise. The nutrient rich digestate is used on local farm land as a high quality eco fertiliser (Table 3).

Table 1. Technical information of the biogas plant

Characteristics	
Date of construction	2010
Size (MW <sub>el</sub> )	1
Volume (m <sup>3</sup> )	3,248
Digester type	Mesophilic digestion

Table 2. Origin of feedstock

Type	Mass per year
Poultry manure	1 kt
Dairy manure	7 kt
Food waste	10 kt
Dairy sludge	3 kt
Total	21 kt

Table 3. Yearly biogas production and average composition

Component	Estimation
CH <sub>4</sub> (%)	57,8
CO <sub>2</sub> (%)	38,2
H <sub>2</sub> S (ppm)	170
O <sub>2</sub> (%)	0,8
N <sub>2</sub> (%)	3,2
Siloxanes (‰)	0,1
Total biogas production (Mm <sup>3</sup> )	2,424
Biogas per tonne of feedstock (m <sup>3</sup> /t)	~65

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### Current process and disposal routes for end products

All digested feedstock is pastuerised by heating to 72°C for over one hour in 25 m<sup>3</sup> batches. All of the digestate is used on farm land controlled by the plant. The use of digestate has reduced the dependency on artificial fertiliser with little to no artificial fertiliser added. Due to the increase in capacity in the plant and the resulting increase in digestate more digestate application options are needed.

### Current problems and obstacles

The high moisture content of digestate adds unnecessary transport and land application cost. By reducing the digestate volume and maintaining the nutrient levels the fertiliser value of the digestate is enhanced and significantly lowers transportation and application costs providing an all important route to market for digestate.

Table 4. NPK content of digestate

	Percentage of total solids
N total	8,8
NH <sub>4</sub> -N	6
P <sub>2</sub> O <sub>5</sub>	3,6
K <sub>2</sub> O	5,9

### Current drivers for interest in Nutrient Recovery and Reuse (NRR) technologies

By producing biogas from organic materials Greengas AD Plant acts as a sustainable alternative to landfill for their bio-waste suppliers.

The Systemic Project could help to find ways of enhancing nutrient recovery and see if there are ways to process the digestate into an organic fertiliser by reducing the moisture content of the digestate.

